

Fabrication of Nanostructured Molybdenum Nitride on Carbon Nanotube – Reduced Graphene Oxide Compound for Hydrogen Evolution Reaction in Alkaline Media

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Due to environmental pollution and depletion of fossil fuels, sustainable and eco-friendly energy sources are required to replace them. Hydrogen has been considered as a sustainable alternative to fossil fuels owing to its high energy density, abundance, and cleanness. Electrochemical water splitting is a green and sustainable method for hydrogen production. Even though Pt-based catalysts show the best performance for Hydrogen Evolution Reaction (HER), their industrial applications are restricted because of their high price and scarcity. Here, we fabricated molybdenum nitride-based electrocatalysts (Mo_2N , $\text{Mo}_2\text{N}/\text{GR}$, $\text{Mo}_2\text{N}/\text{CNT}$, $\text{Mo}_2\text{N}/\text{CNT}-\text{GR}$) as Pt-free electrocatalysts for the HER. The Mo_2N -based catalysts were fabricated by the modified urea-glass route and their electrochemical properties were analyzed in alkaline media (1M KOH). In this route, urea was employed as a nitrogen source for nitride formation instead of NH_3 gas used in typical nitride synthesis. Among these catalysts, $\text{Mo}_2\text{N}/\text{CNT}-\text{GR}$ showed the best performance for HER in alkaline media.